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May 21, 2019 ***Via Email***

Mr. Drew Hoffert
Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation
1130 North Westcott Road
Schenectady, NY 12306
drew.hoffert@dec.ny.gov

RE: Supplemental Remedial Investigation Work Plan
Cohoes/Saratoga Road Site
City of Cohoes, Albany County
BCP Site ID No.: C401077

Dear Mr. Hoffert:

C.T. Male Associates Engineering, Surveying, Architecture, Landscape Architecture & Geology, D.P.C. (C.T. Male) has prepared this Supplemental Remedial Investigation Work Plan (RIWP) to address the comments from the NYS Department of Environmental Conservation (DEC) to the March 2019 Draft Remedial Investigation Report (RIR) for the above referenced Site. The comments were presented in the letter from DEC dated April 29, 2019.

The following presents the supplemental investigative tasks planned for the Site to further define the extent of contamination as requested by DEC. The results of these supplemental investigative tasks will be incorporated into the March 2019 Draft RIR and resubmitted to DEC for review.

Further Define the Extent of PFAS Contamination Within the Site

Analytical results from one (1) groundwater sample collected from RI-installed monitoring well RI5 identified total per- and polyfluoroalkyl substances (PFAS) in groundwater at a concentration of 500 parts per trillion (ppt). Based on these detections, the following supplementary investigative tasks will be conducted to further define the nature and extent of PFAS (see the attached Figure for existing and proposed RI sampling locations).

-Groundwater samples will be collected from RI-installed monitoring wells RI4 and RI5 and analyzed for the DEC list of 21 PFAS.

-Two additional soil borings, identified as RI9 and RI10 on the attached figure, will be completed to aid in the collection of one (1) historic fill material (HFM) sample and one (1) native soil sample from each soil boring for laboratory analysis for the DEC list of 21 PFAS.

Monitoring wells at RI9 and RI10 will be installed, and groundwater samples will be collected and analyzed for the DEC list of 21 PFAS.

Further Evaluation of Semi-Volatile Organic Compounds (SVOCs) in Groundwater

One (1) groundwater sample collected from RI-installed monitoring well RI6 depicted SVOCs at concentrations exceeding NY Ambient Water Quality Standards. As monitoring well RI6 is hydraulically up-gradient and within 25 feet of the Sites eastern boundary, the following supplementary investigative tasks will be completed to further assess the extent of SVOCs in groundwater.

-One (1) groundwater sample will be collected from RI-installed monitoring well RI6 and analyzed for SVOCs.

-If laboratory analysis of the groundwater sample collected from monitoring well RI6 reconfirms the presence of SVOCs above NY Ambient Water Quality Standards, an additional monitoring well (identified as RI11 on the attached figure) will be installed hydraulically down-gradient from monitoring well RI6 and adjacent to the Site's eastern property boundary. A groundwater sample will then be collected from monitoring well RI11 for laboratory analysis for SVOCs.

Means and Methods

The means and methods (i.e., advancement of soil borings, installation of monitoring wells, sample collection, etc) for the supplementary investigative tasks will conform to the NYSDEC-approved May 2018 (Revised October 2018) RIWP for the Site (i.e., October 2018 RIWP).

-The groundwater sampling will be conducted in general accordance with the October 2018 RIWP and the NYSDEC authored August 9, 2018 *Collection of Groundwater Samples for PFAS from Monitoring Wells sampling Protocol* and the July 2018 *Groundwater Sampling for Emerging Contaminants*, which are attached hereto for reference.

-Quality Assurance/Quality Control (QA/QC) samples will be collected for the two (2) media types (HFM/native soil and groundwater) sampled. The QA/QC samples will include a replicate (duplicate), matrix spike (MS), matrix spike duplicate (MSD) and equipment blank.

-Four (4) rinsate blanks will be collected for laboratory analyses for the DEC list of 21 PFAS from the equipment and materials used for the PFAS-related soil borings and monitoring wells (RI9, RI10) to assess potential PFAS cross-contamination. One (1) sample will be collected from the decontaminated driller sampling barrel, two (2) samples will be collected from the PVC well material (riser and screen) and one (1) sample will be collected of the water to be used for decontamination of the drilling tools.

-The analytical data will be validated by an independent data validator and the results of the validation will be presented in Data Usability Summary Reports (DUSRs) pursuant to Appendix 2B of DER-10.

-Particulate and volatile organic compound (VOC) monitoring will be initiated during advancement of the soil borings in accordance with the NYS Department of Health (DOH) Community Air Monitoring Program (CAMP), as presented in the HASP of the October 2018 RIWP.

Please do not hesitate to contact me at s.bieber@ctmale.com and/or 518-860-9737 should you have any questions.

Respectfully submitted,
C.T. MALE ASSOCIATES

Stephen Bieber, CHMM
Project Scientist

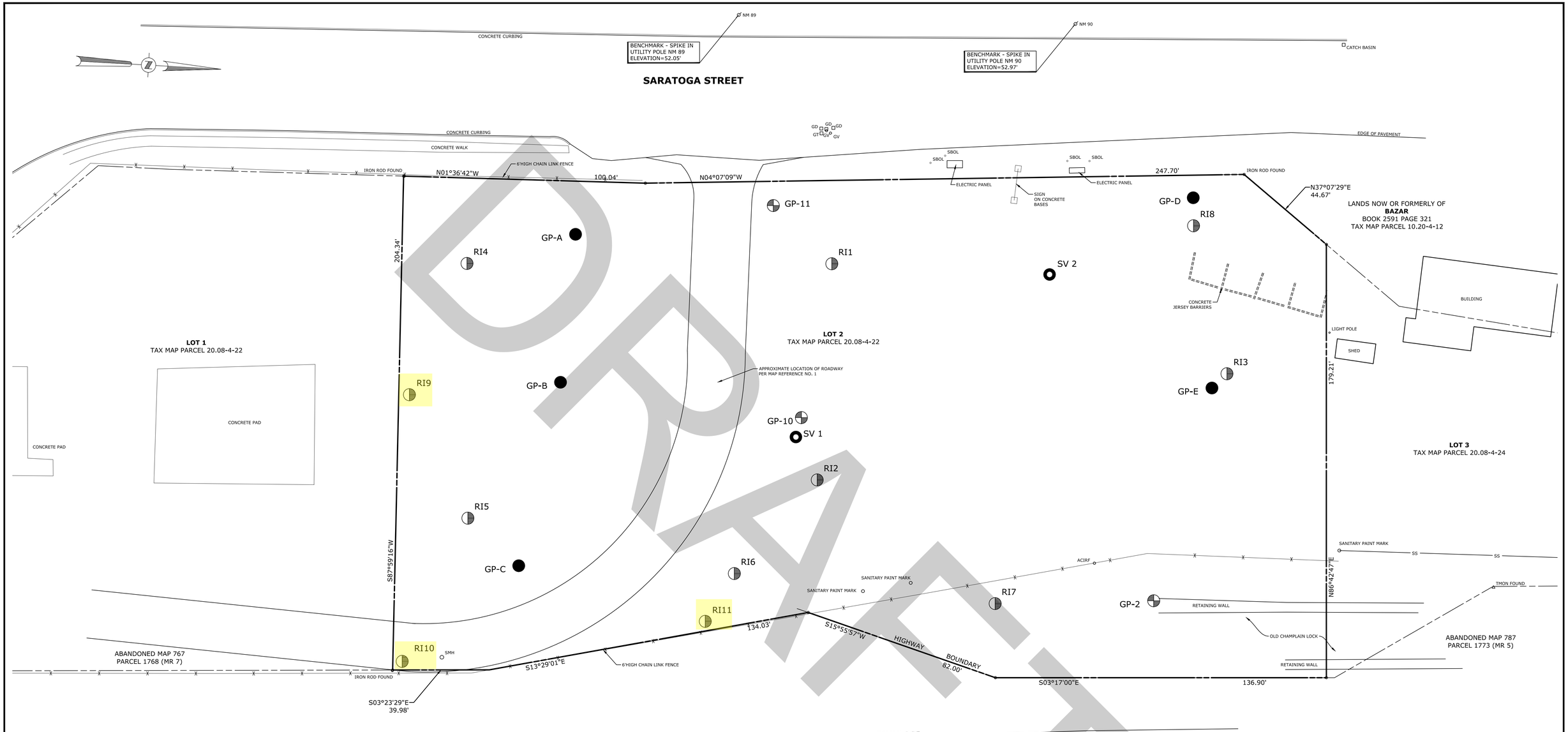
Attachments

ec: Sue McCann, Cohoes II Limited Partnership
Melissa Cherubino, Cohoes II Limited Partnership
Kelly Melaragno, Cohoes II Limited Partnership
Arunesh Ghosh, NYSDOH
Kirk Moline, C.T. Male Associates

XREFS: NONE

PROJECT NUMBER: 17.7652

CAD DWG. FILE NAME: FIGURE 2_177652.dwg



SAMPLING LOCATIONS CHART

SAMPLING LOCATION	GRADE ELEVATION	TOP OF CASING	TOP OF 2" PVC	NORTHING	EASTING	LATITUDE	LONGITUDE
RI1	46.64	50.45	49.90	1432620.5996	707073.3214	N 42°45'47.018"	W 73°41'58.245"
RI2	42.82	46.82	46.28	1432619.6910	707162.9285	N 42°45'47.001"	W 73°41'57.044"
RI3	51.51			1432786.3753	707109.3714	N 42°45'48.652"	W 73°41'57.741"
RI4	39.68	43.64	42.84	1432469.9355	707081.8189	N 42°45'45.529"	W 73°41'58.151"
RI5	36.70	40.45	39.78	1432476.3463	707186.9845	N 42°45'45.583"	W 73°41'56.740"
RI6	39.33	43.20	42.51	1432587.6930	707203.5414	N 42°45'46.681"	W 73°41'56.504"
RI7	40.61	44.57	43.69	1432696.0947	707209.7723	N 42°45'47.751"	W 73°41'56.407"
RI8	51.64			1432769.0867	707049.0485	N 42°45'48.487"	W 73°41'58.552"
SV1	43.03			1432609.8742	707145.7080	N 42°45'46.906"	W 73°41'57.276"
SV2	50.76			1432710.7865	707072.5744	N 42°45'47.909"	W 73°41'58.244"

LEGEND

RI1	RI SAMPLING LOCATIONS. SURFACE SOIL SAMPLES WERE COLLECTED FROM RI1 TO RI8. SOIL BORINGS WERE ADVANCED AT RI1 TO RI7 FOR THE COLLECTION OF SUBSURFACE HFM AND NATIVE SOIL SAMPLES. RI1, RI2 AND RI4 TO RI7 WERE CONVERTED INTO MONITORING WELLS FOR THE COLLECTION OF GROUNDWATER SAMPLES.
SV-1	RI SOIL VAPOR SAMPLING LOCATION
GP-C	APPROXIMATE SOIL BORING/MONITORING WELL LOCATION FROM 2017 PHASE II ESAs
GP-10	APPROXIMATE SOIL BORING/MONITORING WELL LOCATION FROM 2017 PHASE II ESAs
GD	GAS DRIP
GT	GAS TEST
GV	GAS VALVE
SBOL	STEEL BOLLARD
TMON	TRIANGULAR MONUMENT FOUND

MAP REFERENCE:

1. "Survey & Map of Lands to be Conveyed to Cohoes II Limited Partnership #385 Saratoga Street - Cohoes, N.Y." City of Cohoes, Albany County, New York prepared by Frederick J. Metzger Land Surveyor, P.C. dated December 7, 2018 and revised to December 10, 2018 Drawing No. 18-096.

MAP NOTES:

1. Boundary lines shown hereon are based upon map reference no. 1 and does not represent a boundary survey by the undersigned.
2. North orientation and bearings are Grid North based on the New York State Plane Coordinate System, East Zone, NAD 83/2011 epoch 2010.00 as obtained from GPS observations.
3. Vertical datum shown hereon is NAVD 88 (Geoid 12A) and was obtained from GPS observations.
4. No attempt was made to locate any underground utilities.
5. The location of underground improvements or encroachments, if any exist, or as shown hereon, are not certified. There may be underground utilities, the existence of which are not known to the undersigned. Size and location of all underground utilities and structures must be verified by the appropriate authorities. Dig Safely New York must be notified prior to conducting test borings, excavation and construction.

BAR SCALE
20 0 10 20 40
1 inch = 20 ft.

DATE		REVISIONS RECORD/DESCRIPTION	DRAFTER	CHECK	APPR.
1/28/19	1	MISCELLANEOUS REVISIONS	MDD		
2/5/19	2	REVISED LOCATION OF RI6	MDD		
	3				
	4				
	5				
	6				
	7				
	8				
	9				

DESIGNED:
DRAFTED : MDD
CHECKED : WJN
PROJ. NO : 17.7652
SCALE : 1"=20'
DATE : JAN. 15, 2019

Supplemental Remedial Investigation Well Locations

COHOES/SARATOGA ROAD BCP SITE
385 SARATOGA STREET

CITY OF COHOES — ALBANY COUNTY, NEW YORK

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SHEET 1 OF 5
DWG. NO: 19-131

CAD DWG. FILE NAME: K:\Projects\177652\Survey\Drawings and Maps\FIGURE 2_177652 .dwg

Collection of Groundwater Samples for Per- and Polyfluoroalkyl Substances (PFAS) from Monitoring Wells Sample Protocol

Samples collected using this protocol are intended to be analyzed for perfluorooctanoic acid (PFOA) and other perfluorinated compounds by Modified (Low Level) Test Method 537.

The sampling procedure used must be consistent with the NYSDEC March 1991 Sampling Guidelines and Protocols http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf with the following materials limitations.

At this time acceptable materials for sampling include: stainless steel, high density polyethylene (HDPE) and polypropylene. Additional materials may be acceptable if proven not to contain PFAS. **NOTE: Grunfos pumps and some bladder pumps are known to contain PFAS materials (e.g. Teflon™ washers for Grunfos pumps and LDPE bladders for bladder pumps).** All sampling equipment components and sample containers should not come in contact with aluminum foil, low density polyethylene (LDPE), glass or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer. Standard two step decontamination using detergent and clean water rinse will be performed for equipment that does come in contact with PFAS materials. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials must be avoided. Many food and drink packaging materials and "plumbers thread seal tape" contain PFAS.

All clothing worn by sampling personnel must have been laundered multiple times. The sampler must wear nitrile gloves while filling and sealing the sample bottles.

Pre-cleaned sample bottles with closures, coolers, ice, sample labels and a chain of custody form will be provided by the laboratory.

1. Fill two pre-cleaned 250 mL HDPE or polypropylene bottle with the sample.
2. Cap the bottles with an acceptable cap and liner closure system.
3. Label the sample bottles.
4. Fill out the chain of custody.
5. Place in a cooler maintained at 4 ± 2º Celsius.

Collect one equipment blank for every sample batch, not to exceed 20 samples.

Collect one field duplicate for every sample batch, not to exceed 20 samples.

Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, not to exceed 20 samples.

Request appropriate data deliverable (Category A or B) and an electronic data deliverable.

Groundwater Sampling for Emerging Contaminants

July 2018

Issue: NYSDEC has committed to analyzing representative groundwater samples at remediation sites for emerging contaminants (1,4-dioxane and PFAS) as described in the below guidance.

Implementation

NYSDEC project managers will be contacting site owners to schedule sampling for these chemicals. Only groundwater sampling is required. The number of samples required will be similar to the number of samples where "full TAL/TCL sampling" would typically be required in a remedial investigation. If sampling is not feasible (e.g., the site no longer has any monitoring wells in place), sampling may be waived on a site-specific basis after first considering potential sources of these chemicals and whether there are water supplies nearby.

Upon a new site being brought into any program (i.e., SSF, BCP), PFAS and 1,4-dioxane will be incorporated into the investigation of groundwater as part of the standard "full TAL/TCL" sampling. Until an SCO is established for PFAS, soil samples do not need to be analyzed for PFAS unless groundwater contamination is detected. Separate guidance will be developed to address sites where emerging contaminants are found in the groundwater. The analysis currently performed for SVOCs in soil is adequate for evaluation of 1,4-dioxane, which already has an established SCO.

Analysis and Reporting

Labs should provide a full category B deliverable, and a DUSR should be prepared by an independent 3rd party data validator. QA/QC samples should be collected as required in DER-10, Section 2.3(c). The electronic data submission should meet the requirements provided at: https://www.dec.ny.gov/chemical/62440.html ,

The work plan should explicitly describe analysis and reporting requirements.

PFAS sample analysis: Currently, ELAP does not offer certification for PFAS compounds in matrices other than finished drinking water. However, laboratories analyzing environmental samples (ex. soil, sediments, and groundwater) are required, by DER, to hold ELAP certification for PFOA and PFOS in drinking water by EPA Method 537 or ISO 25101.

Modified EPA Method 537 is the preferred method to use for groundwater samples due to the ability to achieve 2 ng/L (ppt) reporting limits. If contract labs or work plans submitted by responsible parties indicate that they are not able to achieve similar reporting limits, the project manager should discuss this with a DER chemist. Note: Reporting limits for PFOA and PFOS should not exceed 2 ng/L.

PFAS sample reporting: DER has developed a PFAS target analyte list (below) with the intent of achieving reporting consistency between labs for commonly reportable analytes. It is expected that reported results for PFAS will include, at a minimum, all the compounds listed. This list may be updated in the future as new information is learned and as labs develop new capabilities. If lab and/or matrix specific issues are encountered for any particular compounds, the NYSDEC project manager will make case-by-case decisions as to whether particular analytes may be temporarily or permanently discontinued from analysis for each site. Any technical lab issues should be brought to the attention of a NYSDEC chemist.

Some sampling using this full PFAS target analyte list is needed to understand the nature of contamination. It may also be critical to differentiate PFAS compounds associated with a site from other sources of these chemicals. Like routine refinements to parameter lists based on investigative findings, the full PFAS target analyte list may not be needed for all sampling intended to define the extent of contamination. Project managers may approve a shorter analyte list (e.g., just the UCMR3 list) for some reporting on a case by case basis.

1,4-Dioxane Analysis and Reporting: The method detection limit (MDL) for 1,4-dioxane should be no higher than 0.35 µg/l (ppb). Although ELAP offers certification for both EPA Method 8260 SIM and EPA Method 8270 SIM, DER is advising the use of method 8270 SIM. EPA Method 8270 SIM provides a more robust extraction procedure, uses a larger sample volume, and is less vulnerable to interference from chlorinated solvents.

Full PFAS Target Analyte List

Group	Chemical Name	Abbreviation	CAS Number
Perfluoroalkyl sulfonates	**Perfluorobutanesulfonic acid**	**PFBS**	**375-73-5**
	Perfluorohexanesulfonic acid	**PFHxS**	**355-46-4**
	Perfluoroheptanesulfonic acid	PFHpS	375-92-8
	Perfluorooctanessulfonic acid	**PFOS**	**1763-23-1**
	Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluoroalkyl carboxylates	Perfluorobutanoic acid	PFBA	375-22-4
	Perfluoropentanoic acid	PFPeA	2706-90-3
	Perfluorohexanoic acid	PFHxA	307-24-4
	Perfluoroheptanoic acid	**PFHpA**	**375-85-9**
	Perfluorooctanoic acid	**PFOA**	**335-67-1**
	Perfluorononanoic acid	**PFNA**	**375-95-1**
	Perfluorodecanoic acid	PFDA	335-76-2
	Perfluoroundecanoic acid	PFUA/PFUdA	2058-94-8
	Perfluorododecanoic acid	PFDoA	307-55-1
	Perfluorotridecanoic acid	PFTriA/PFTrDA	72629-94-8
	Perfluorotetradecanoic acid	PFTA/PFTeDA	376-06-7
Fluorinated Telomer Sulfonates	6:2 Fluorotelomer sulfonate	6:2 FTS	27619-97-2
	8:2 Fluorotelomer sulfonate	8:2 FTS	39108-34-4
Perfluorooctane-sulfonamides	Perfluroroctanesulfonamide	FOSA	754-91-6
Perfluorooctane-sulfonamidoacetic acids	N-methyl perfluorooctanesulfonamidoacetic acid	N-MeFOSAA	2355-31-9
	N-ethyl perfluorooctanesulfonamidoacetic acid	N-EtFOSAA	2991-50-6

Bold entries depict the 6 original UCMR3 chemicals